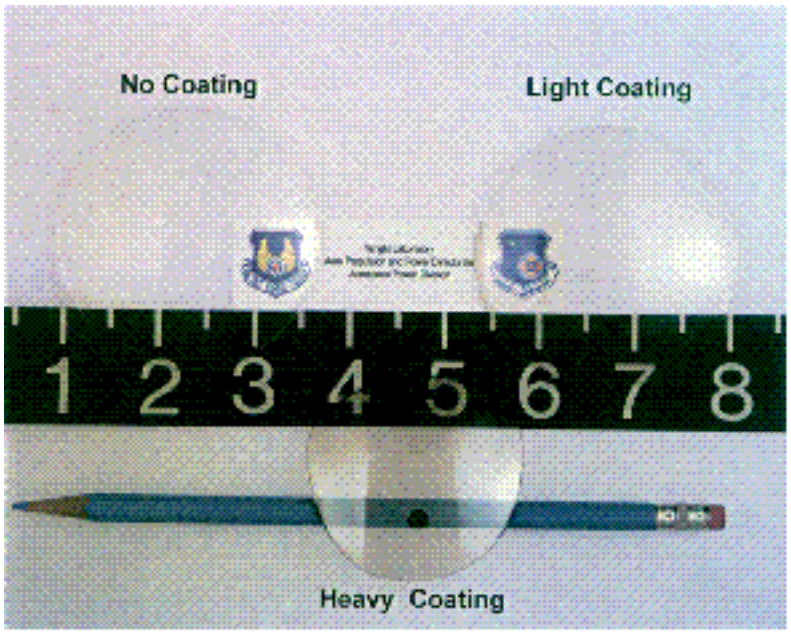
ION BEAM DIAMOND-LIKE CARBON COATING PROCESS PROVIDES LOW COST, DURABLE COATINGS



Payoff

The ion beam diamond-like carbon coating process enables low cost, abrasion resistant and chemically/biochemically inert coatings to be applied to a variety of surfaces. This process, using non-toxic materials, can produce protective coatings with a wide variety of thickness and optical transmissivity which can be designed to meet a large number of military and commercial user needs.

Accomplishment

The ion beam diamond-like carbon (DLC) coating process, developed under a program sponsored by the Propulsion Directorate's Aerospace Power Division, produces low cost, durable, high quality coatings which are free of pin holes, have excellent transmissivity and excellent adhesion to a number of different types of surfaces. An ion beam applied DLC coating can endure a wide range of environmental conditions such as temperatures up to 500 degrees F, abrasion and interaction with chemicals/biochemical/gaseous agents.

Background

Although the ion beam DLC coating process is one of a number of techniques for deposition of DLC that have evolved, it is unique. It is a low temperature coating process utilizing low energy plasma that does not adversely affect the substrate. Products exhibit very low surface friction, excellent glare reduction, ultraviolet filtering and good infrared (IR) transmissivity. Flat and moderately curved surfaces can be handled up to a diameter of 8.5 inches (1000 square centimeters) using current equipment. This technology, developed and demonstrated under contracts with Universal Energy Systems and K-Systems, has a large number of military and commercial applications. Potential applications for ion beam DLC protective coatings include aircraft transparencies, automotive windows, eye glasses, food packaging equipment, electronic components, IR imaging system optical windows, computer hard drives, cutting tools and body implants. A Cooperative Research and Development Agreement, executed by the Propulsion Directorate with nanoFILM LTD, has demonstrated an eye glasses coating with excellent results. This technology has been validated under the Aeronautical System Center's Senior Assessment Review process.